"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

L 07924-67
ACC NR: AP6033386

various amounts of yttrium nitrate. The fluorescence intensity is directly proportional to the yttrium content in the zone if the total amount is not more than 4—4.5 μg. The least determinable amount is 0.5 μg of yttrium. Orig. art. has: 1 figure and 1 table. [Authors' abstract]

SUB CODE: 07/ SUBM DATE: 16Jul65/ ORIG REF: 005/ OTH REF: 003/

Card 2/2 vmb

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

ACC NR: AP6019048 (N) SOURCE CODE: UR/0078/66/011/002/002/0369/0373

AUTHOR: Melent'yeva, Ye. V.; Kononenko, L. I.; Poluektov, N. S.

ORG: none

TITLE: 1,10-Phenanthroline-dibenzoylmethane complexes of rare-earth elements

SOURCE: Zhurnal neorganicheskoy khimii, v. 11, no. 2, 1966, 369-373

TOPIC TAGS: rare earth element, samarium compound, europium compound, quantitative analysis, luminescence

ABSTRACT: The composition and some properties of the rare-earth complexes were studied, representing ternary systems composed of the rare-earth element, 1,10-phenanthroline (Phen), and dibenzoylmethane (DBM). An investigation of the isomolar series, turbidimetric determinations, and the quantitative analysis proved that the complexes showed a 1:1:3 molecular ratio of rare-earth element:Phen:DBM. The analytical results of the complexes studied are given in Table 1. The Sm and Eu complexes emitted luminescence at the 550-630 and 570-640 mμ ranges, respectively. The luminescence study of benzene solutions of the Eu complex showed that the 1:1:3 ratio remained valid. Orig. art. has: 8 fig. and 1 table.

UDC: 546.65 : 541.49

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

ACC NR: AP6019048

Table 1. Results of the analysis of the Phen-DBM complexes of rare-earth elements

Complex	Color	Melting temp. C	Calculated, %			Found, %			Ratio Me:Phen:DBM
			Me	Phen	DBM	Me	Phen	DBM	
Y-Phen-3(DBM)	yellow	180—182	9,47	19,26	71,27	9,36	19,15	71,15	1 : 1 : 3,03
Nd-Phen-3(DBM)	lilac	182—183	14,50	18,13	67,37	14,33	18,06	67,30	1 : 1,01 : 3,04
Sm-Phen-3(DBM)	yellow	182—184	15,03	18,02	66,95	15,00	17,90	66,85	1 : 0,95 : 3,00
Eu-Phen-3(DBM)	straw-yellow	184—186	15,17	17,98	66,85	15,09	17,86	56,75	1 : 1 : 3,00
Tb-Phen-3(DBM)	yellow	185—186	15,77	17,85	66,38	15,60	17,80	66,30	1 : 1 : 3,03

Card 2/3

Card 3/3

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

L 08660-67 EWT(m)/EWP(j) RM
ACC NR: AP6019047 (A) SOURCE CODE: UR/0078/66/011/002/0363/0368

AUTHOR: Tishchenko, M. A.; Kononenko, L. I.; Vitkun, R. A.; Poluektov, N. S. 27

ORG: none

TITLE: Complexes of rare-earth elements with 1-phenyl-3-methylpyrazolone-5 and 1-tolyl-3-methylpyrazolone-5

SOURCE: Zhurnal neorganicheskoy khimii, v. 11, no. 2, 1966, 363-368

TOPIC TAGS: rare earth element, terbium compound, dysprosium compound, neodymium compound, yttrium compound, erbium compound, fluorescence

ABSTRACT: Complexes of Pr, Nd, Er, Y, Tb, and Dy with 1-phenyl-3-methylpyrazolone-5 or 1-tolyl-3-methylpyrazolone-5 were prepared by a modified Knorr's method (Ann. Chem. 238, 137, 1887). Urotropine was added to the reaction mixture to keep it neutral. The results of the analysis of the complexes prepared are given in Table 1. Among the complexes studied only the Tb and Dy complexes were fluorescent (See Figures 1 and 2). Orig. art. has: 5 fig. and 2 tables.

Card 1/3 UDC: 546.65 : 541.49

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

L 08660-67
ACC NR: AP6019047

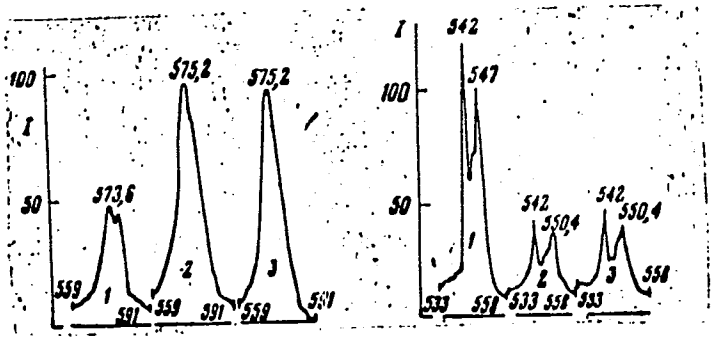

Fig. 1

Fig. 2

Figures 1 and 2. Fluorescence spectra of Dy (Fig. 1) and Tb (Fig. 2) complexes with 4'-sulfophenyl-3-methylpyrazolone-5 (1), 1-phenyl-3-methylpyrazolone-5 (2), and 1-tolyl-3-methylpyrazolone-5 (3)

Card 2/3

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

L 08660-67
ACC NR: AP6019047

Table 1. Results of the analysis of the phenyl-methyl- and tolyl-methylpyrazolone complexes

Complex	Melting point, C	Calculated, %			Found, %			Ratio Me:PhMP (or TMP)
		Me	PhMP (TMP)	H_2O	Me	PhMP (TMP)	H_2O	
Pr-tri(PhMP)-ate	206--207	20,85	76,5	2,65	20,1	77	2,8	1:3,1
Nd-tri(PhMP)-ate	210—211	21,2	76,16	2,64	21,0	75,8	3,0	1:2,98
Er-tri(PhMP)-ate	208—210	23,8	73,6	2,6	22,9	73,7	2,9	1:3,08
Y-tri(PhMP)-ate	198--200	14,2	82,9	2,9	13,5	82,1	3,7	1:3,1
Tb-tri(TMP)-ate	208--210	21,5	76,0	2,4	20,3	76,0	2,6	1:3,15
Nd-tri(TMP)-ate	207—209	19,8	77,7	2,5	20,2	78,0	2,5	1:2,98

Me = rare-earth element; PhMP = 1-phenyl-3-methylpyrazolone-5; TMP = 1-tolyl-3-methyl-pyrazolone

SUB CODE: 07/ SUBM DATE: 25Jun64/ ORIG REF: 003/ OTH REF: 006

Card 3/3 nle

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

ACC NR: AP7005539 SOURCE CODE: UR/0075/66/021/011/1392/1394

AUTHOR: Kononenko, L. I.; Mishchenko, S. A.; Poluektov, N. S.

ORG: Institute of General and Inorganic Chemistry, UkrSSR Academy of Sciences, Laboratories (Institut obshchey i neorganicheskoy khimii AN USSR, Laboratorii) in Odessa

TITLE: Investigation of the fluorescent reaction for terbium with phenyl salicylate

SOURCE: Zhurnal analiticheskoy khimii, v. 21, no. 11, 1966, 1392-1394

TOPIC TAGS: terbium, rare earth element, terbium analysis, fluorescence, salol, phenyl salicylate, reagent

ABSTRACT: A method for fluorimetric determination of terbium using phenyl salicylate has been introduced. The method can be applied to the analysis of concentrates of rare earth elements of the yttrium subgroup. The method has been tested on a number of samples of rare earth oxides. The mean experimental error is ± 4.5%. As a reagent for terbium phenyl salicylate (salol) was compared to

UDC: 543.70

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

ACC NR: AP7005539

other reagents with respect to luminescence using a weighted sample of a terbium compound with salol and the ISP-5 spectrograph. Orig. art. has: 3 diagrams, 1 table, and 1 formula. [Based on authors' abstract]. [KP]

SUB CODE: 07, 20/SUBM DATE: 29Oct65/ORIG REF: 008/

Card 2/2

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

L 32955-66 EWP(j)/EWT(m)/EWP(t)/ETI IJP(c) RM/JD/JG

ACC NR: AP6015743 SOURCE CODE: UR/0073/66/032/005/0508/0513

AUTHOR: Tishchenko, M. A.; Kononenko, L. I.; Vitkun, R. A.; Poluektov, N. S.

ORG: Odessa Laboratories, Institute of General and Inorganic Chemistry AN UkrSSR (Laboratorii v Odesse Instituta obshchey i neorganicheskoy khimii AN UkrSSR)

TITLE: Use of pyrazolone derivatives for fluorometric determination of dysprosium

SOURCE: Ukrainskiy khimicheskiy zhurnal, v. 32, no. 5, 1966, 508-513

TOPIC TAGS: dysprosium, spectrum determination, rare earth, fluorescence spectrum, nonmetallic organic derivative, terbium

ABSTRACT: The authors study the feasibility of using phenyl-3-methylpyrazolone-5 (PMP) and tolyl-3-methylpyrazolone-5 (TMP) to replace 4-sulfophenyl-3-methylpyrazolone-5 (SPMP) for fluorometric determination of dysprosium in oxides of other rare-earth elements. The usefulness of SPMP for determining dysprosium in the presence of terbium is limited due to partial superposition of the fluorescence bands as well as by the bright fluorescence of trivalent terbium ions. The structural formulas of the three compounds are shown in the figure. The reagents were used in the form of a 2.5% solution in ethanol. The fluorescence spectrum for complex compounds of Dy and Tb with the tolyl derivative show three bright bands in the visible region for the Tb complex with maxima at 488-497.5, 543-546 and 580 mμ and two bands for the Dy complex with

UDC: 543.426-4:546.664

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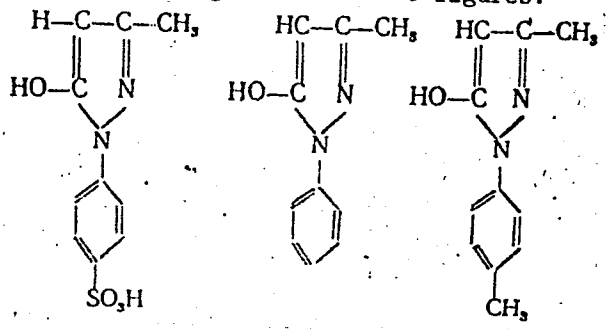
"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

L 32955-66

ACC NR: AP6015743

maxima at 482.5-487.5 and 573 mμ. The best bands for quantitative identification are at 573 mμ for Dy and at 543-546 mμ for Tb. Experiments were conducted to determine the effect of various factors on the luminescence intensity of a complex compound of Dy with PMP and TMP. The greatest relative luminescence intensity was observed in a solution with a pH of 6-7 with 5 mg of reagent in a total volume of 10 ml, allowing the solution to stand for 40 minutes after adding the reagents. The method developed for fluorescence determination of dysprosium may be used for identification of this element in mixtures of rare-earth oxides with a sensitivity of 0.005-0.1% Dy_2O_3 depending on the nature of the basic element. Orig. art. has: 8 figures.



SPMP PMP TMP

SUB CODE: 07/ SUBM DATE: 04Sep64/ ORIG REF: 006/ OTH REF: 002

Card 2/2

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

L 30244-66 EWT(m)/EWP(t)/ETI IJP(c) JD/JG

ACC NR: AP6013883 SOURCE CODE: UR/0073/65/031/011/1189/1197

AUTHOR: Mishchenko, V. T.; Lauer, R. S.; Yefryushina, N. P.; Poluektov, N. S.

ORG: Odessa Laboratories, Institute of General and Inorganic Chemistry, AN UkrSSR (Institut obshchey i neorganicheskoy khimii AN UKrSSR, Laboratorii v Odesse)

TITLE: Absorption-spectrophotometric determination of rare earth elements in tributyl phosphate extracts

SOURCE: Ukrainskiy khimicheskiy zhurnal, v. 31, no. 11, 1965, 1189-1197

TOPIC TAGS: rare earth element, spectrophotometric analysis, phosphate, solvent extraction, organometallic compound, absorption spectrum

ABSTRACT: The object of the study was to work out a rapid and convenient method of determining rare earth elements directly in tributyl phosphate and its solutions, following the separation of mixtures of rare earth elements by this extracting agent. To this end, the absorption spectra of tributyl phosphate complexes of Pr, Nd, Sm, Eu, Gd, Dy, Ho, Er, and Yb were investigated. It was found that during complexing in tributyl phosphate solutions, most of the absorption band maxima are displaced toward longer wavelengths by 1 to 10 mμ. A shift of certain absorption peaks toward shorter wavelengths, e. g., that of Eu, is also observed. At the same time, the peak height of many absorption bands frequently increases by a factor of 1.1-3.5 and more. The con-

UDC: 546.65:535.243:541.49

Card 1/2

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

L 30244-66
ACC NR: AP6013883

ditions for the determination of Pr, Nd, Sm, Ho, and Er in a mixture of rare earth elements of the cerium and yttrium subgroups in tributyl phosphate were established: (a) in concentrated solutions of rare earth elements (up to 130 mg/ml based on the oxide) and (b) when the concentrated solutions were diluted both by tributyl phosphate itself and other solvents. The sensitivity of the method is (in mg/ml based on the oxide): for neodymium, 0.03; holmium and erbium, 0.04; praseodymium, 0.06, and samarium, 0.18 for a cell length of 2 cm. Orig. art. has: 10 figures, 4 tables.

SUB CODE: 07/ SUBM DATE: 11Jun64/ ORIG REF: 006/ OTH REF: 004

Card 2/2 CC

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

L 41972-65 EWA(d)-2/EWT(m)/EWP(t)/EWP(b) IJP(c) JD/JG

ACCESSION NR: AP5007541 S/0368/65/002/001/0021 0025

AUTHOR: Meshkova, S. B.; Polucktov, N. S. 21

TITLE: Change in the atomic absorption of alkali metals in a flame upon shift of the ionization equilibrium under the influence of an external electric field

SOURCE: Zhurnal prikladnoy spektroskopii, v. 2, no. 1, 1965, 21-25

TOPIC TAGS: atomic absorption, alkali metal, flame spectroscopy, ionization, electric field effect

ABSTRACT: In view of the fact that atomic emission and absorption of alkali metals in flames depend on the flame temperature, the authors investigated the influence of application of an electric field on the ionization in various portions of the flame, by measuring the atomic absorption of light, the magnitude of which is connected with the concentration of the metal atoms in the flame and which does not depend on the temperature. A diagram of the set-up is shown in Fig. 1 of the Enclosure. The apparatus used to measure the absorption of light in the flame was similar to that used by one of the authors in atomic-absorption spectral analysis (Polyuchtov, Zav. lab. v. 27, 830, 1961). The results have established that if a

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

L 47052-65

ACCESSION NR: AP5007541

constant or alternating electric field is applied to graphite electrodes in a flame, the absorption of light by the alkali-metal atoms is changed in a manner similar to the change in the initial intensity. The weakening of atomic absorption of K, Rb, and Ca near the cathode was measured both along the width of the flame (between the electrodes) and along its height (along the electrode and above it). The observed effect is found to be connected with a decrease in the partial pressure of the metal atoms in the gas flame, due to the shift of the ionization equilibrium towards higher values of ionization. Orig. art. has: 5 figures.

ASSOCIATION: None

SUBMITTED: 18Jul64 ENCL: 01 SUB CODE: OP, IC

NR REF SOV: 005 OTHER: 001

Card 2/3

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

L 55081-65 EWT(m)/EWP(t)/EWP(b) IJP(c) JD/JG UR/0075/65/020/005/0554/0560
ACCESSION NR: AP5013498 543.70

21
38
48

AUTHOR: Ovchar, L. A.; Vitkun, R. A.; Poluektov, N. S.

TITLE: Flame photometric determination of gadolinium and yttrium using high dispersion equipment

SOURCE: Zhurnal analiticheskoy khimii, v. 20, no. 5, 1965, 554-560

TOPIC TAGS: gadolinium, yttrium, flame photometry, rare earth

ABSTRACT: The purpose of this work was to show the applicability of flame photometry to the determination of gadolinium and yttrium using a spectrophotometer assembled from a three prism 15 P-51 spectrograph and an FEP-1 photoelectric attachment. Analytically a 597.2 mμ band was used for the determination of yttrium and a 460-456.5 mμ system of three bands for the determination of gadolinium. The sensitivity of determination was 1 μg/ml Y_2O_3 and 15-20 μg/ml Gd_2O_3. The sensitivity of the determination of gadolinium and yttrium in mixtures of rare earth oxides is 0.25% and 0.05-0.1% respectively. Cerium intensifies Gd and Y emission. The investigation of this effect reveals that the action results when Ce is present in

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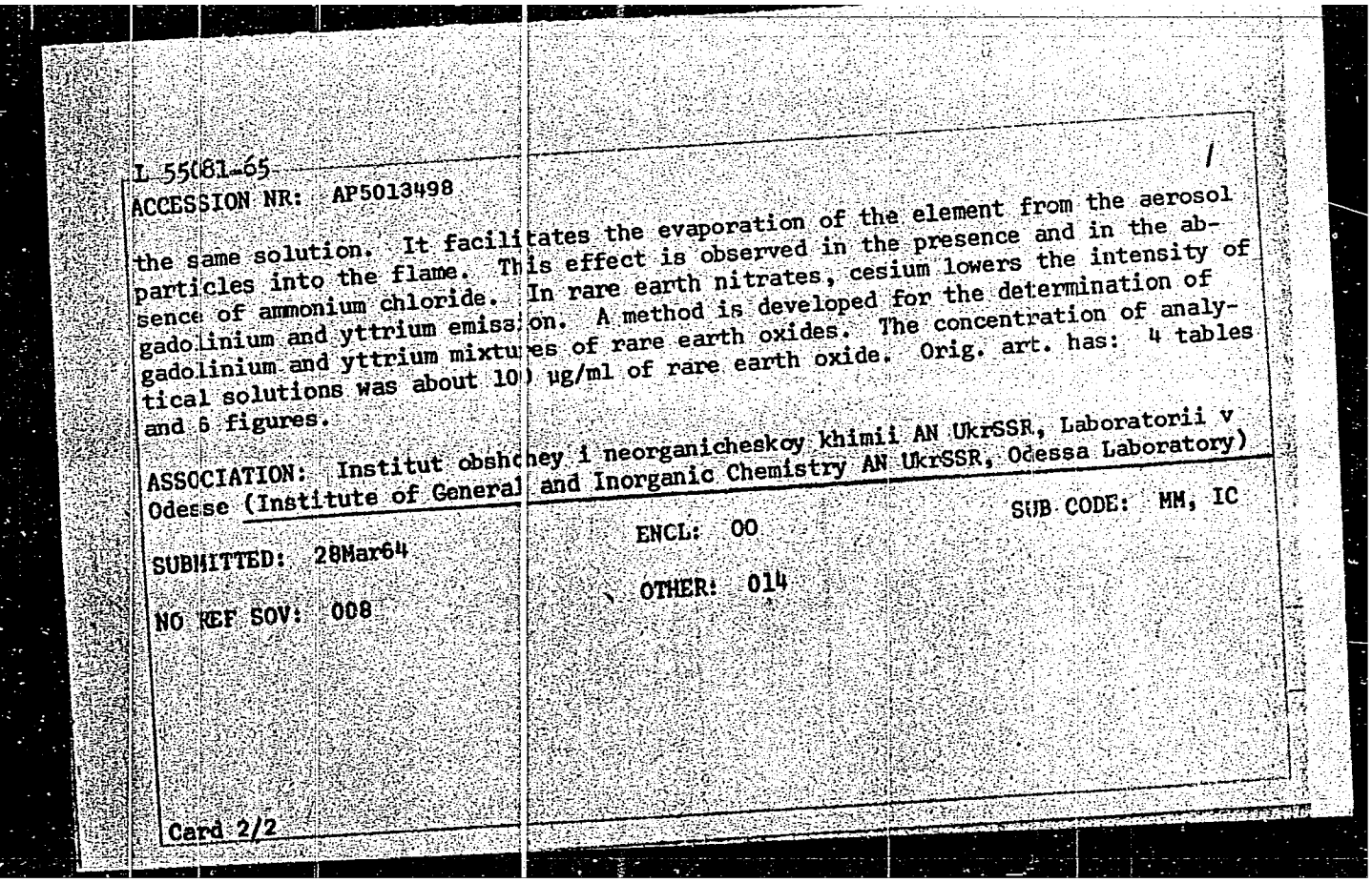

L 55081-65
ACCESSION NR: AP5013498

the same solution. It facilitates the evaporation of the element from the aerosol particles into the flame. This effect is observed in the presence and in the absence of ammonium chloride. In rare earth nitrates, cesium lowers the intensity of gadolinium and yttrium emission. A method is developed for the determination of gadolinium and yttrium mixtures of rare earth oxides. The concentration of analytical solutions was about 10 µg/ml of rare earth oxide. Orig. art. has: 4 tables and 6 figures.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN UkrSSR, Laboratorii v Odesse (Institute of General and Inorganic Chemistry AN UkrSSR, Odessa Laboratory)

SUBMITTED: 28Mar64 ENCL: 00 SUB CODE: MM, IC

NO REF SOV: 008 OTHER: 014

Card 2/2

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

KONONENKO, L.I.; POLUEKTOV, N.S.; NIKONOVA, M.P.

Extraction-fluorometric determination of samarium and europium in a mixture of rare-earth oxides. Zav. lab. 30 no.7:779-783 '64. (MIRA 18:3)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR.

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

MISHCHENKO, V.T.; POLUEKTOV, N.S.

Spectrophotometric study of citric acid complexes of rare-earth elements in alkaline solutions. Ukr. khim. zhur. 30 no.7:663-667 '64. (MIRA 18:1)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR.

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

NIKONOVA, M.P.; MISHCHENKO, V.T.; POLUEKTOV, N.S.

Spectrophotometric determination of praseodymium and neodymium impurities in the preparations of the ceria subgroup. Zav. lab. 30 no.9:1055-1057 '64. (MIRA 18:3)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR.

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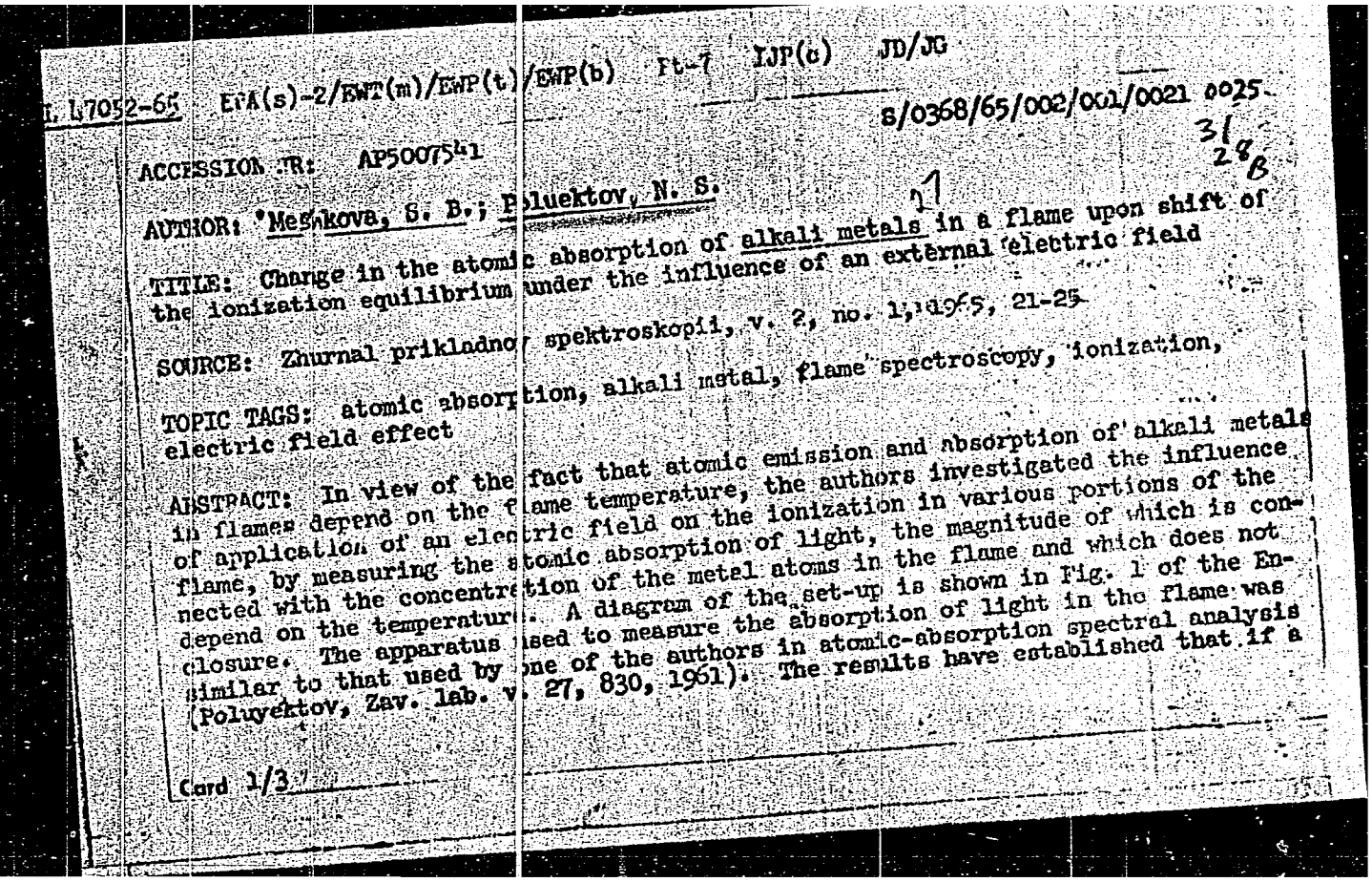

L 17052-65 EPA(s)-2/EWT(m)/EWP(t)/EWP(b) Pt-7 IJP(c) JD/JG

ACCESSION NR: AP5007541 S/0368/65/002/001/0021 0025

AUTHOR: *Meshkova, S. B.; Poluektov, N. S. 21

TITLE: Change in the atomic absorption of alkali metals in a flame upon shift of the ionization equilibrium under the influence of an external electric field

SOURCE: Zhurnal prikladnoy spektroskopii, v. 2, no. 1, 1965, 21-25

TOPIC TAGS: atomic absorption, alkali metal, flame spectroscopy, ionization, electric field effect

ABSTRACT: In view of the fact that atomic emission and absorption of alkali metals in flames depend on the flame temperature, the authors investigated the influence of application of an electric field on the ionization in various portions of the flame, by measuring the atomic absorption of light, the magnitude of which is connected with the concentration of the metal atoms in the flame and which does not depend on the temperature. A diagram of the set-up is shown in Fig. 1 of the Enclosure. The apparatus used to measure the absorption of light in the flame was similar to that used by one of the authors in atomic-absorption spectral analysis (Poluyektov, Zav. lab. v. 27, 830, 1961). The results have established that if a

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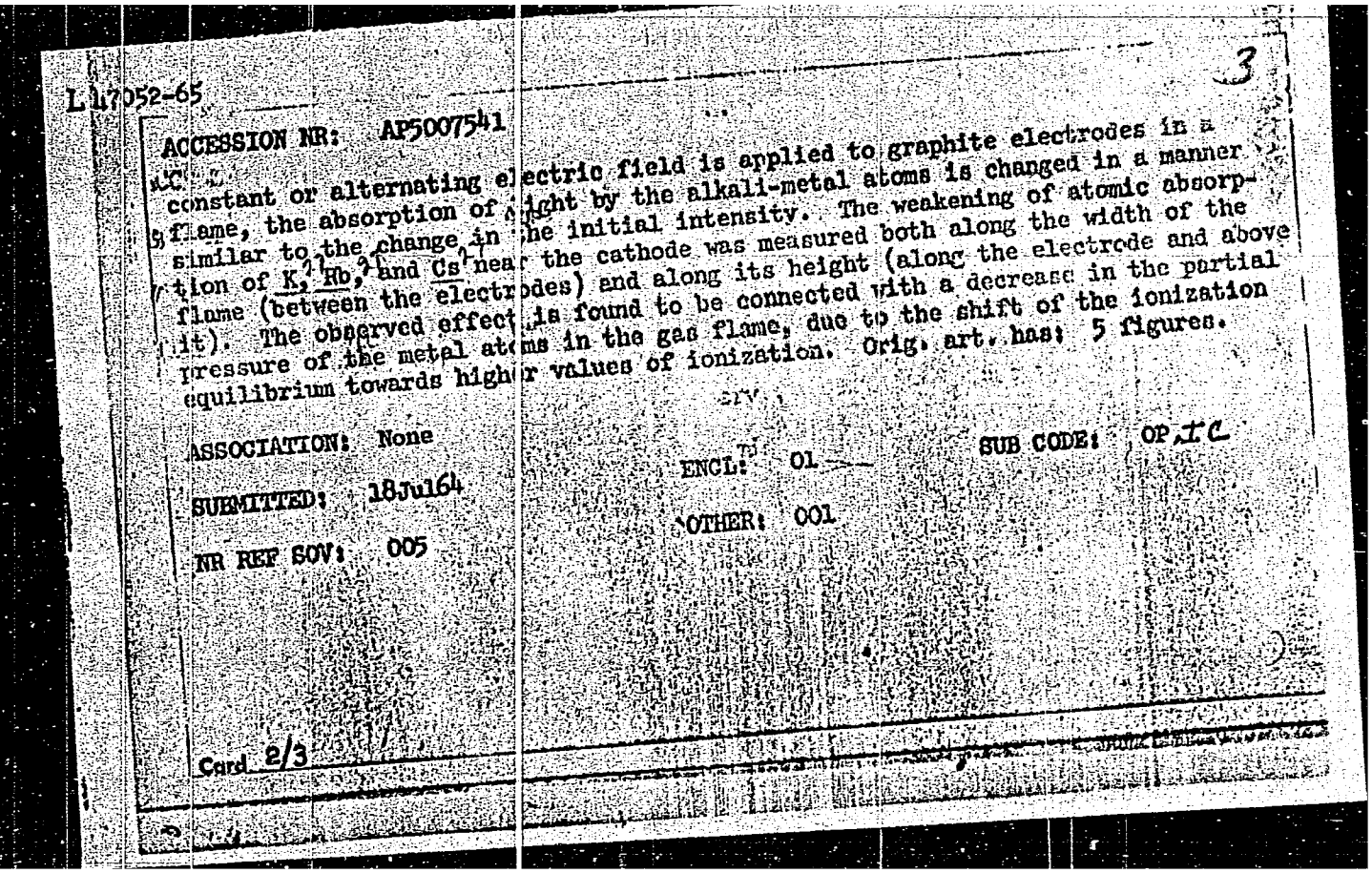

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ACCESSION NR: AP5007541

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constant or alternating electric field is applied to graphite electrodes in a flame, the absorption of light by the alkali-metal atoms is changed in a manner similar to the change in the initial intensity. The weakening of atomic absorption of K, Rb, and Cs near the cathode was measured both along the width of the flame (between the electrodes) and along its height (along the electrode and above it). The observed effect is found to be connected with a decrease in the partial pressure of the metal atoms in the gas flame, due to the shift of the ionization equilibrium towards higher values of ionization. Orig. art. has: 5 figures.

ASSOCIATION: None

SUBMITTED: 18Jul64 ENCL: 01 SUB CODE: OP, IC

NR REF SOV: 005 OTHER: 001

Card 2/3

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

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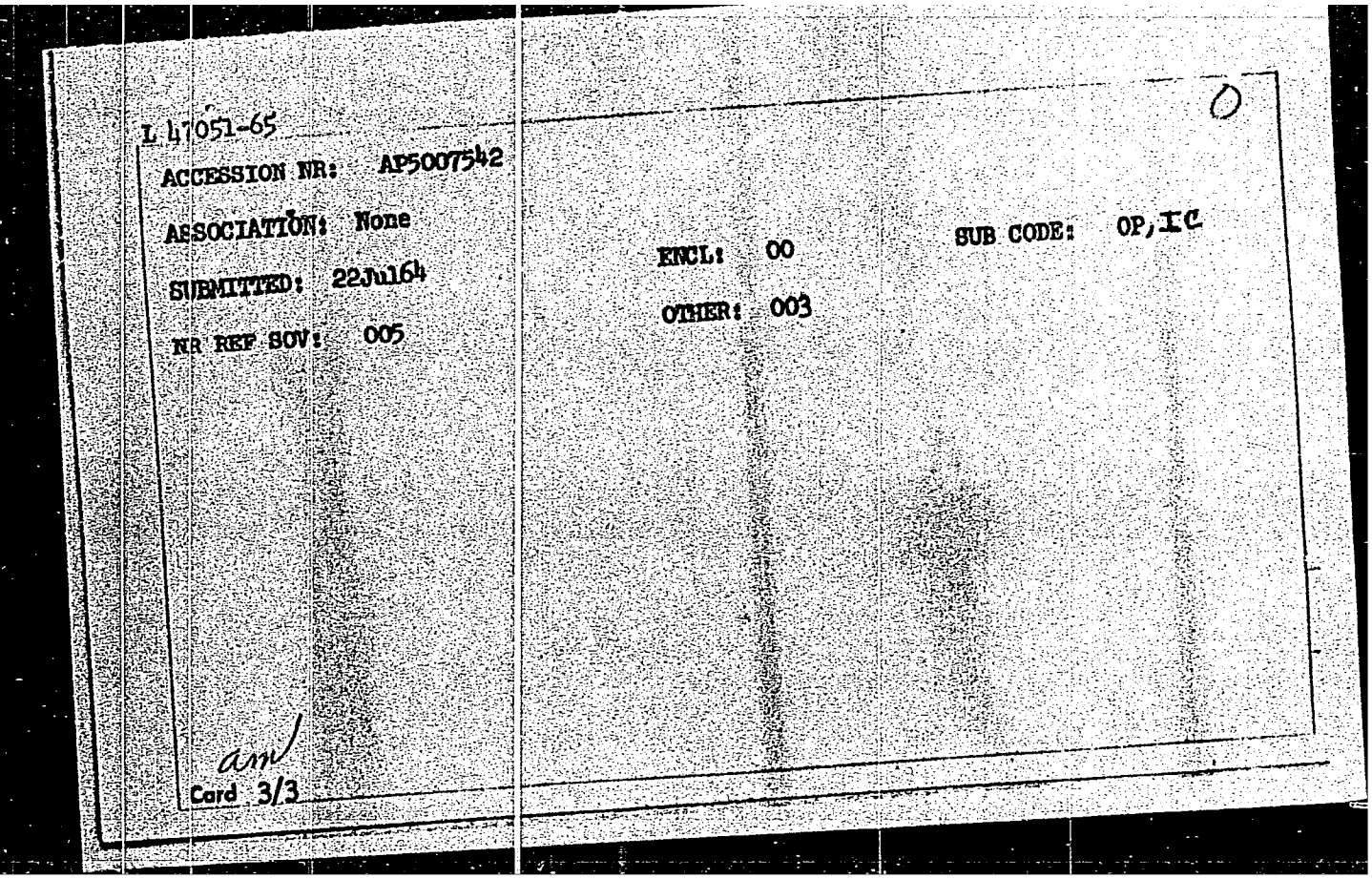

L 47051-65

ACCESSION NR: AP5007542

ASSOCIATION: None

SUBMITTED: 22Jul64

NR REF SOV: 005

ENCL: 00

OTHER: 003

SUB CODE: OP, IC

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APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

POLUEKTOV, N.S.; VITKUN, R.A.; ZELYUKOVA, Yu.V.

Determination of milligamma amounts of mercury by atomic absorption in the gaseous phase. Zhur. anal. khim. 19 no.8:937-942 '64. (MIRA 17:11)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR, Laboratoriya v Odesse.

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

KONONENKO, L.I.; TISHCHENKO, M.A.; POLUEKTOV, N.S.

4-Sulfophenyl-3-methyl-5-pyrazolone as a reagent for the fluorometric determination of dysprosium and terbium.
Zhur. anal. khim. 19 no.7:829-834 '64. (MIRA 17:11)

1. Institute of General and Inorganic Chemistry, Ukrainian S.S.R. Academy of Sciences, Laboratories in Odessa.

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

LAUER, R.S.; POLUEKTOV, N.S.

Zone localization of some individual rare-earth elements on a paper chromatogram. Zhur. anal. khim. 19 no.2:199-201 '64. (MIRA 17:9)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR, laboratoriya v Odesse.

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

TISHCHENKO, M.A.; LAUER, R.S.; POLUEKTOV, N.S.

Separation of rare-earth elements into subgroups by means of cupferron. Ukr. khim. zhur. 30 no.4:390-395 '64. (MIRA 17:6)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR, laboratorii v Odesse.

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

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POLUEKTOV, N.S.; OVCHAR, L.A. (Odessa)

Effect of an electric field on the radiation intensity of elements in a flame. Zhur. fiz. khim. 37 no.4:817-821 Ap '63. (MIRA 17:7)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR, laboratorii v Odesse.

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L 2107-65 EWT(m)/EWP(q)/EWP(b) AFWL/ESD(gs)/RAEM(t) JD/JG

ACCESSION NR: AP4042624 S/0075/64/019/007/0829/0834

AUTHOR: Kononenko, L. I.; Tishchenko, M. A., Poluektov, N. S.

TITLE: 4-sulfophenyl-3-methylpyrazolone-5 as a reagent for the fluorimetric determination of dysprosium and terbium

SOURCE: Zhurnal analiticheskoy khimii, v. 19, no. 7, 1964, 829-834

TOPIC TAGS: dysprosium, terbium, quantitative analysis, spectro fluorimetric analysis, sulfophenyl methylpyrazolone, color reagent, rare earth element analysis, sensitivity

ABSTRACT: 4-sulfophenyl-3-methylpyrazolone-5 is a sensitive reagent for the spectrofluorimetric determination of Dy and Tb upon excitation with ultraviolet radiation from a mercury tube; work was conducted with an ISP-51 spectrograph with a FEP-1 photoelectric device. This reagent gives green fluorescence with Tb, light orange with Dy, weak fluorescence with Sm and none with Er. The intensity of the fluorescence with Dy and with Tb is a linear function of the rare earth concentration; maximum intensity occurs at pH 6-7 and is developed within 20 minutes. There are three molecules of reagent per one Dy in the fluorescent

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

ACCESSION NR: AP4042981 S/0051/64/017/001/0073/0077

AUTHORS: Poluektov, N. S.; Kononenko, L. I.; Vitkun, R. A.; Nikonova, M. P.

TITLE: Quenching of luminescence of europium in intra-complex compounds in the presence of other rare-earth elements

SOURCE: Optika i spektroskopiya, v. 17, no. 1, 1964, 73-77

TOPIC TAGS: europium, luminescence quenching, rare earth element, energy level, spectrum analysis

ABSTRACT: With an aim at its possible application to analysis, a study was made of the effect of extraneous rare earth elements on the glow intensity I_{Eu} of europium in precipitates of mixed phenanthroline-atrphane and phenanthroline-tenoiltrifluoroacetone complexes. The experimental procedure is described. A correlation was established between $\log I_{Eu}$ and the difference between the energy of

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

ACCESSION NR: AP4033702 S/0073/64/030/004/0390/0395

AUTHOR: Tishchenko, M. A.; Lauer, R. S.; Poluektov, N. S.

TITLE: Separation of rare earth elements into subgroups with the aid of cupferron.

SOURCE: Ukrainskiy khimicheskiy zhurnal, v. 30, no. 4, 1964, 390-395

TOPIC TAGS: rare earth element, separation, rare earth subgroup, cerium subgroup, yttrium subgroup, polar organic solvent, nonpolar solvent, cupferron, rare earth cupferronate, solubility

ABSTRACT: Experiments were run to determine to what extent the solubility properties of the rare earth cupferronates may be used in separating them into the cerium and yttrium subgroups. The yttrium subgroup cupferronates are readily soluble in polar organic solvents (alcohols, esters, ketones) while the cerium subgroup cupferronates precipitate in these solvents soon after their extraction. Little separation is effected in nonpolar solvents. The cupferronates are most soluble in cyclohexanone, only slightly less soluble in cyclohexanol, ethylacetate and isoamyl alcohol. The solubility of the yttrium subgroup elements (Y, Dy, Ho, Er, Yb) is approximately the same. In the cerium subgroup solubility increases

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L 2122-65 EWT(m)/EWP(q)/EWP(b) AEDC(a) RDW/JD/RM
ACCESSION NR: AP4042115 S/0073/64/030/007/0663/0667

13
12

AUTHOR: Mishchenko, V. T.; Poluektov, N. S.

TITLE: Spectrophotometric investigation of citrate complexes of the rare earth elements in alkali solutions

SOURCE: Ukrainskiy khimicheskiy zhurnal, v. 30, no. 7, 1964, 663-667

TOPIC TAGS: neodymium citrate complex, erbium citrate complex, spectrophotometric study, molar ratio method, isomolar series method, dissociation, apparent instability constant, complex polymer

ABSTRACT: By spectrophotometric study of solutions of neodymium and erbium citrate complexes with a constant Me:Cit ratio of 1:2 and a constant concentration of reacting ions, it was found the complexes exist in two forms, one at pH 4-6 (where optical density increased with increase in pH) and the other at pH 8-10 (where optical density increased at first and then decreased). The existence of a third complex at pH below 3, indicated several times in the literature but was not observed. It was established by the methods of molar ratios and isomolar series that at pH = 9 Nd and Er form a complex with a Me:Cit molecular ratio of 1:1. From the

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ACCESSION NR: AP4042115

amount of citric acid required to form clear rare earth salts in alkali media it was assumed a 3:2 Me:Cit complex may also be formed. The degree of dissociation and the approximate value of the apparent instability constant of the complexes was calculated. Since the latter is fairly constant at low complex concentrations but increased 2-3 times with increase in concentration (from 0.01 to 0.02%) of the complex, it was suggested that the complex compound polymerized to $(MeCit)_n$. Orig. art. has: 8 figures and 1 table.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN UkrSSR(Institute of General and Inorganic Chemistry AN UkrSSR)

SUBMITTED: 07Jul63 [illegible]: 00 ENCL: 00

SUB CODE: GC[illegible] NO REF SOV: 010 OTHER: 009

Card 2/2

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

ACCESSION NR: AP4040757 S/0073/64/030/006/0629/0635

AUTHOR: Poluektov, N. S. ; Vitkun, R. A.; Kononenko, L. I.

TITLE: Determination of europium in microquantities by fluorescence

SOURCE: Ukrainskiy khimicheskiy zhurnal, v. 30, no. 6, 1964, 629-635

TOPIC TAGS: europium fluorescence, europium determination europium complex , europium, microquantity, fluorescence, fluorescence intensity, measurement

ABSTRACT: This work was prompted by the complexity of conventional fluorescent methods of detecting europium requiring special phosphoroscopes, preparation of samples by calcination or melting, and complex spectrographic technology. The authors developed a sensitive method for determining microquantities of europium by measuring the fluorescence intensity of a phenanthroline-atophan complex of rare earths in suspension. This complex cation $(MePhen_2)^{3+}$ forms difficultly soluble salts with some acid anions. In presence of europium in the complex, bright fluorescence in the UV light of mercury lamp is observed. This method permits the determination of

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ACCESSION NR: AP4040757

0.001 -0.2 γ Eu_2O_3 in 5 ml solution depending upon the nature of the admixtures. The greatest sensitivity is achieved in the presence of La, Gd, Tb and Y where the presence of Eu can be found when its content amounts to $10 \cdot 10^{-4}$%. Sensitivity of Eu_2O_3 determination in other rare earths amounts to 0.02-0.1%. Determinations were made with the aid of the ISP-51 spectrograph with photoelectric attachment FEP-1. Illumination was by SVD-120A mercury lamp with a quartz condenser. Typical for Eu spectrum is a peak of 612 mμ. Optimum pH = 6-7. Orig. art. has: 8 figures, 1 formula, 3 tables.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN UkrSSR, Laboratoriya v Odesse (Institute of General and Inorganic Chemistry, AN UkrSSR)

SUBMITTED: 18May63 ENCL: 00

SUB CODE: IC NR REF SOV: 009 OTHER: 002

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APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

ACCESSION NR: AP4044893 S/0032/64/030/009/1055/1057

AUTHORS: Nikonova, M. P.; Minichenko, V. T.; Poluektov, N. S.

TITLE: Spectrophotometric determination of praseodymium and neodymium impurities in compounds of the cerium subgroup

SOURCE: Zavodskaya laboratoriya, v. 30, no. 9, 1964, 1055-1057

TOPIC TAGS: spectrophotometry, rare earth, absorption band, praseodymium, neodymium, cerium / SF 10 spectrophotometer

ABSTRACT: The possibility of determining Pr and Nd in small quantities in solutions, without lowering the sensitivity of determination, has been achieved by diaphragm restriction of light beams passing through a rectangular vessel (50 mm long) containing the solution. The light beams entering the vessel are restricted by diaphragms, passing through only a thin layer of solution (amounting to 8-10 mg). Measurements were made with an SF-10 spectrophotometer. Pr was determined by an absorption band with maximum at 444 mμ, Nd by a band with a maximum at 522 or at 742.5 mμ. Graphs were plotted to show dependence of optical density (at these maximums) on the concentration of solutions (chlorides of pure rare earths). The

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

ACCESSION NR: AP4035084 S/0032/64/000/005/0553/0554

AUTHORS: Poluektov, N. S.; Meshkova, S. B.; Nikonova, M. P.

TITLE: Determination of calcium admixtures in samples of hafnium and zirconium by flame photometry

SOURCE: Zavodskaya laboratoriya, no. 5, 1964, 553-554

TOPIC TAGS: hafnium, hafnium salt, zirconium, zirconium salt, calcium admixture determination, calcium zirconate formation, calcium hafnate formation, photometric radiation intensity, oxyquinoline radiation

A method was developed for counteracting the diminution of calcium radiation in flame photometry by adding oxyquinoline. Aliquots of 100-400 mg hydrous $ZrOCl_2$, $Zr(NO_3)_4$, $Zr(SO_4)_2$, or $HfOCl_2$ were dissolved in 3 ml of hot 6-normal HCl. They were then diluted to 10 ml, and equal portions were placed in three 10-ml test tubes. A standard solution of calcium salt was added to two of these (to bring the concentration of Ca to 0.25-0.50 and 2.5-5.0 micrograms/liter respectively). This was followed by adding 1 ml of a 20% oxyquinoline solution in acetic acid.

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

ACCESSION NR: AP4041581 S/0078/64/009/007/1606/1612

AUTHOR: Poluektov, N. S.; Tserkasevich, K. V.

TITLE: Rare earth element complexes with gallic acid

SOURCE: Zhurnal neorganicheskoy khimii, v. 9, no. 7, 1964, 1606-1612

TOPIC TAGS: rare earth gallic complex, rare earth element complex, gallic acid, rare earth chloride, spectophotometry, potentiometric titration

ABSTRACT: There are no indications in the literature concerning reactions of gallic acid with rare earth elements and this prompted the authors to study their complexes. By neutralizing with ammonia a mixture of gallic acid with rare earth chlorides at pH 4.1-4.2 a precipitate is first formed, then, upon further addition of alkali, it is dissolved forming a complex compound. These compounds were analyzed by spectrophotometry and subjected to potentiometric titration. The difficult soluble compounds have a tentative formula of

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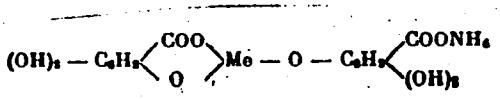
ACCESSION NR: AP4041581



In alkaline solutions with 1 N KOH rare earth ions form with gallic acid complex compounds with a molecular rate Me:Gal = 1:2. From neutral and alkine solutions solid compounds with the same Me:Gal proportion have been extracted. Orig. art. has 9 figures, 2 formulas, 3 tables.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN UkrSSR, laboratoriya v Odesse (Institute of General and Inorganic Chemistry, AN UkrSSR, Odessa Laboratory)

SUBMITTED: 03May63 DATE ACQ: 00 ENCL: 00

SUB CODE: IC NO REF SOV: 002 OTHER: 005

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

ACCESSION NR: AP4041765 S/0032/64/030/007/0779/0783

AUTHORS: Kononenko, L. I.; Poluektov, N. S.; Nikonova, M. P.

TITLE: Extraction fluorimetric determination of samarium and europium in a mixture of oxides of rare earth elements

SOURCE: Zavodskaya laboratoriya, v. 30, no. 7, 1964, 779-783

TOPIC TAGS: rare earth element, rare earth analysis, fluorimetric determination, samarium, europium, samarium phenanthroline thenoyltrifluoroacetone, europium phenanthroline thenoyltrifluoroacetone, triple samarium complex, triple europium complex, benzene complex extraction, spectrograph ISP 51, fluorescent spectrum

ABSTRACT: A method for extracting and analyzing rare earths is presented. It involves the formation of triple complexes of samarium and europium with phenanthroline (PT) and thenoyltrifluoroacetone (TTFA). These complexes are extracted with benzene, and are examined fluorimetrically. From 1 to 2 ml of the solution containing the chlorides of Sm and Eu at a pH range of 4-5 are placed into a separatory funnel. To these solutions are added 1 ml of a 4% solution of urotropin, 0.1 ml of a 0.5% alcohol solution of TTFA, and 0.15-0.25 ml of a 3% alcohol solution of PT. The mixture is diluted with water to the 5-ml mark, allowed to stand

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ACCESSION NR: AP4041765

for 2-5 minutes, and is extracted with 5 ml of benzene after 1-2 minutes of shaking. The benzene extract is removed, filtered, and subjected to fluorimetric examination in an SF-4 spectrophotometer. The spectra are registered on an ISP-51 spectrograph. The peak in the luminescence spectrum of samarium was at 562 millimicrons and in europium at 612 millimicrons. It was found that the intensity of luminescence was only slightly affected by an excess of PT, but that it was lowered by an excess of TTFA over the optimum. The graphs showing the relation between the intensity of luminescence and the amounts of samarium and europium represented straight lines. The minimum amount of samarium and europium detectable in 5 ml of the benzene extract was 0.05 and 0.002 micrograms, respectively. This method was tested on laboratory-compounded mixtures of rare-earth elements and also on the natural minerals such as monazite and xenotime. The maximum error for Sm_2O_3 was 0.4%; for Eu_2O_3 it was 0.14%. Orig. art. has: 6 charts, 1 table, and 1 formula.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii Akademii nauk UkrSSR (Institute of General and Inorganic Chemistry, Academy of Sciences, Ukranian SSR)

SUBMITTED: 00 ENCL: 00

SUB CODE: GC,OC NO REF SOV: 009 OTHER: 002

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APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

ACCESSION NR: AP4043572 S/0078/64/009/008/1822/1829

AUTHOR: Mishchenko, V. T.; Poluektov, N. S.

TITLE: Polynuclear citric acid complexes of the rare earth elements

SOURCE: Zhurnal neorganicheskoy khimii, v. 9, no. 8, 1964, 1822-1829

TOPIC TAGS: rare earth element complex, citric acid complex, polynuclear rare earth citrate, trinuclear rare earth citrate, absorption spectra, molar ratio method, isomolar series method, aluminum rare earth citrate, thorium rare earth citrate, uranium rare earth citrate

ABSTRACT: The authors continued their work (Ukr. khim. Zhurn. 31, 9 (1964) on the formation of rare earth element-citric acid complexes to obtain data on the composition and extent of formation of polynuclear compounds by interaction between two rare earth citrates. The interaction of 0.01-0.1M solutions of La^{+3} or Y^{+3} with 0.01-0.04M solutions of Pr, Nd, Sm and Er citrate, and of Er with Nd and Sm citrate was studied spectrophotometrically at pH 9, using more than

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[redacted]

Concentric atomizer for a flame photometer. Zav. lab. 30 no.5:635 '64. (MIRA 17:5)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR.

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

POLUEKTOV, N.S.; MESHKOVA, S.B.; NIKONOVA, M.F.

Flame photometric determination of calcium impurity in hafnium and zirconium preparations. Zav. lab. 30 no.5:553-554 '64. (MIRA 17:5)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR, laboratorii v Odesse.

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

KONONENKO, L.I.; LAUER, R.S.; POLUEKTOV, N.S.

Extraction-fluorimetric determination of europium and terbium.
Zhur. anal.khim. 18 no.12:1468-1474 D '63. (MIRA 17:4)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR,
Laboratorii v Odesse.

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

VINKOVETSKAYA, S.Ya.; POLUEKTOV, N.S.

Sulfonaphtholazoresorcinol. Metod.poluch.khim.reak. i prepar. no.7:25-27 '63. (MIRA 17:4)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR, Odessa.

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

POLUEKTOV, N.S.; OVCHAR, L.A.; MESHKOVA, S.B.

Modulation of the radiation of elements in a flame under the effect of an electric field. Zhur. fiz. khim. 37 no.11:2582-2585 N'63. (MIRA 17:2)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR.

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

TSERKASEVICH, K.V.; POLUEKTOV, N.S.

Complex formation of the ions of rare-earth elements with 1,2-dihydroxybenzene-3,5-disulfonic acid ("tairon"). Zhur.neorg.khim. 9 no.1:128-133 Ja '64. (MIRA 17:2)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR. Laboratorii v Odesse.

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

ACCESSION NR: AP4014222 S/0075/64/019/002/0199/0201

AUTHOR: Lauer, R. S.; Poluektov, N. S.

TITLE: Zone location of certain individual rare earth elements on a paper chromatogram

SOURCE: Zhurnal analiticheskoy khimii, v. 19, no. 2, 1964, 199-201

TOPIC TAGS: chromatography, rare earth complex fluorescence, chromatogram zone location, samarium, europium, terbium, lanthanium, lutecium, yttrium, detection, 8 hydroxyquinoline complex, phenthroline complex

ABSTRACT: The fluorescence of organic reagent-rare earth complex compounds has been shown to be suitable for selectively determining the zone location of certain individual rare earths (La, Sm, Eu, Tb, Lu, Y) on a chromatogram after chromatographic separation of their mixtures. Selective detection of Sm, Eu and Tb has been effected for Sm with phenthroline and phenoyltrifluoracetone or dibenzoylmethane, Eu with phenthroline and dibenzoylmethane, and Tb with acetylacetone. La, Lu and Y can be detected as a group with 8-hydroxyquinoline or

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ACCESSION NR: AP4014222

5,7-dibromo-8-hydroxyquinoline, and individually, since their zones are located separately with La at the beginning, Y in the middle and Lu at the end of the chromatogram. The methods are highly sensitive, e.g., 0.005 microgram of Eu or 0.01 micrograms of Tb can be detected. Orig. art. has: 1 table.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN UkrSSR, Laboratoriya v Odesse (Institute of General and Inorganic Chemistry, Odessa Laboratory, AN UkrSSR)

SUBMITTED: 04May63 DATE ACQ: 12Mar64 ENCL: 00

SUB CODE: CH NO REF SOV: 010 OTHER: 003

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APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

TSERKASEVICH, K.V.; POLUEKTOV, N.S.

Complexes of rare-earth elements with pyrocatechol and pyrogallol in alkaline solutions. Ukr.khim.zhur. 30 no.2:146-151 '64.
(MIRA 17:4)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR, Laboratorii v Odesse.

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

POLUEKTOV, N. S.

The Second All-Union Conference on the Preparation and Analysis of High-Purity Elements, held on 24-28 December 1963 at Gorky State University im. N. I. Lobachevskiy, was sponsored by the Institute of Chemistry of the Gorky State University, the Physicochemical and Technological Department for Inorganic Materials of the Academy of Sciences USSR, and the Gorky Section of the All-Union Chemical Society im. D. I. Mendeleyev. The opening address was made by Academician N. M. Zhavoronkov. Some 90 papers were presented, among them the following:

L. I. Kononenko, R. A. Vitkun, and N. S. Poluektov. Fluorescence determination of Eu microimpurities in rare-earth elements.

(Zhur Anal Khim, 19 No 6, 1964 pp. 777-9)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

ACCESSION NR: AP4009349 S/0078/64/009/001/0128/0133

AUTHORS: Tserkasevich, K. V.; Poluektov, N. S.

TITLE: Complex formation of rare earth element ions with 1,2-dihydroxybenzene-3,5-disulfonic acid (Tayron)

SOURCE: Zhurnal neorganicheskoy khimii, v. 9, no. 1, 1964, 128-133

TOPIC TAGS: rare earth element complex, rare earth Tayron complex, neodymium Tayron complex, proseodymium Tayron complex, holmium Tayron complex, erbium Tayron complex, dihydroxybenzenedi-sulfonic acid complex

ABSTRACT: Spectrophotometric study of the reaction between 1,2-dihydroxybenzene-3,5-disulfonic acid (Tayron) and salts of Nd, Pr, Ho or Er shows that two types of complex compounds are formed in aqueous solution: at pH 7 the complex formed has a metal: Tayron ratio of 1:1.5, at pH 14, the ratio is 1:4, as depicted by the formulae:

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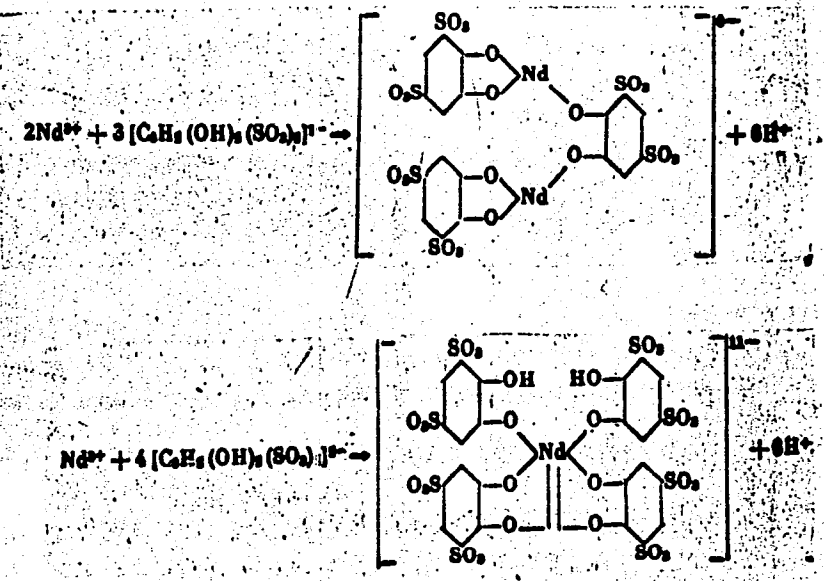
ACCESSION NR: AP4009349



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Card 3/3

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

MISHCHENKO, V.T.; [illegible], E.S.

Polynuclear citric acid complexes of rare-earth elements. Zhur. neorg. khim. 9 no.8:1822-1829 Ag '64. (MIRA 17:11)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR, laboratoriia v Odesse.

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

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OVCHAR, L.A.; VITKUN, R.A.; POLUEKTOV, N.S.

Flame photometric determination of gadolinium and yttrium using the apparatus of higher dispersion. Zhur.anal.khim. 20 no.5:554-560 '65. (MIRA 18:12)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR, Laboratorii v Odesse. Submitted March 28, 1964.

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

L 22165-65 EWT(m)/EWP(b)/EWP(t) ESD(c)/ESD(s) IJP(c) JD/JG

ACCESSION NR: AP4049095 S/0075/64/019/011/1309/1314

AUTHOR: Tserkasevich, K.V.; Poluektov, N.S. 23

TITLE: The use of polyphenol derivatives for increasing the sensitivity of the spectrophotometric determination of some rare earth elements.

SOURCE: Zhurnal analiticheskoy khimii, v. 19, no. 11, 1964, 1309-1314 27

TOPIC TAGS: spectrophotometry, rare earth element, polyphenol derivative, lanthanide series, sodium pyrocatecholdisulfonate, sodium stannite

ABSTRACT: The sensitivity of the spectrophotometric determination of lanthanides (Pr, Nd, Sm, Ho, Er) may be increased 1.6 - 16 fold by using solutions of their complexes with tiron (sodium pyrocatechol disulfonate) in an alkaline medium (1 N KOH). Tiron does not absorb light in the visible part of the spectrum. It is also quite stable, but for reliable measurements the solutions have to be protected from the air by a layer of benzene and a strong reducing agent (sodium stannite). Peaks with maxima in the wavelengths characteristic for each element are reported and the absorption spectra are illustrated. The relationship between optical density in the absorption peaks and concentration was represented by a straight line in the range of concentrations 2.5×10^{-3} to 2.5×10^{-2} M, i.e. about up to the maximal concentrations of 4.1-4.8 mg/ml for Pr, Nd, Ho and Er, and 5.8

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L 22165-65
ACCESSION NR: AP4049095

mg/ml for Sm. Cerium may interfere, since in the presence of oxygen from the air it will form purple-colored complexes with tiron. By adding sodium stannite the cerium effect may be avoided up to a concentration of 1 mg/ml Ce. Orig. art. has: 6 figures and 3 tables.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN UkrSSR Laboratorii v Odesse (Institut of General and Inorganic Chemistry, AN Ukr. SSR, Odessa Laboratories)

SUBMITTED: 10Nov63 ENCL: 00 SUB CODE: IC

NO REF SOV: 011 OTHER: 004

Card 2/2

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

POLUEKTOV, N.S.; VITKUN, R.A.; KONOMENKO, L.I.

Fluorescence determination of microamounts of europium. Ukr. khim. zhur. 30 no.6:629-635 '64. (MIRA 18:5)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR, laboratorii v Odesse.

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

TSERKASEVICH, K.V.; POLUEKTOV, N.S.

Use of polyphenol derivatives for increasing the sensitivity of the spectrophotometric determination of certain rare-earth elements. Zhur. anal. khim. 19 no.11:1309-1314 '64. (MIRA 18:2)

1. Institute of General and Inorganic Chemistry, Ukrainian S.S.R. Academy of Sciences, Laboratories in Odessa.

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

L 4927-66 EWT(m)/EWP(j)/[illegible]/EWP(t)/EWP(b) IJP(c) JD/JG/RM

ACC NR: AP5026579 SOURCE CODE: UR/0073/65/031/010/1031/1035

AUTHOR: Kononenko, L.I.; Melent'yeva, Ye. V.; Vitjun, R. A.; Poluektov, N. S. 24 23

ORG: Odessa Laboratory, Institute of General and Inorganic Chemistry (Institut obshchey i neorganicheskoy khimii, Laboratorii v Odesse)

TITLE: Complexes of rare earth elements with acetylacetone and 1, 10-phenanthroline or 2, 2'-dipyridyl 16

SOURCE: Ukrainskiy khimicheskiy zhurnal, v. 31, no. 10, 1965, 1031-1035

TOPIC TAGS: yttrium compound, lanthanum compound, praseodymium compound, neodymium compound, samarium compound, europium compound, gadolinium compound, terbium compound, erbium compound, fluorescence spectrum

ABSTRACT: Ternary compounds formed by a rare earth metal with acetylacetone (AA) and phenanthroline (Phen) or dipyridyl (Dip) were synthesized from Y, La, Pr, Nd, Sm, Eu, Gd, Tb, and Er, and their composition and properties were studied. Chemical analyses showed that the ratio Me:Dip:AA is very close to 1:1:3. The probable structure of such ternary compounds with Eu and 2, 2'-dipyridyl may be represented as follows:

Card 1/2

UDC 541.49:546.65:535.372

Card 2/2

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APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

POLUEKTOV, N.S.; MESHKOVA, S.B.

Rare-earth complexes with sulfosalicylic acid in aqueous solutions. Zhur. neorg. khim. 10 no.7:1588-1592 Jl '65. (MIRA 18:8)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR, Laboratorii v Odessa.

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

L 6523-66 EWT(m)/EWP(j)/T/EWP(t)/EWP(b) IJP(c) JD/JG/RM

ACC NR: AP5027206 SOURCE CODE: UR/0078/65/010/011/2465/2470

AUTHOR: Kononenko, L. I.; Tishchenko, M. A.; Vitkun, R. A.; Poluektov, N. S.

ORG: None

TITLE: 1,10-phenanthrolinethenoyltrifluoroacetone complexes of rare earth elements

SOURCE: Zhurnal neorganicheskoy khimii, v. 10, no. 11, 1965, 2465-2470

TOPIC TAGS: samarium compound, europium compound, lanthanum compound, neodymium compound, dysprosium compound, yttrium compound, rare earth element

ABSTRACT: The turbidimetric technique was used to study the formation of ternary complexes of rare earth elements (r.e.e.) with 1,10-phenanthroline (Phen) and thenoyltrifluoroacetone (HTTA) in water-ethanol solutions. It was shown by means of the methods of molar ratios and isomolar series that insoluble complexes are formed in which the ratio of the components $Me_{r.e.e.}$: Phen :HTTA = 1:1:3. These ternary complexes of lanthanum, neodymium, samarium, europium, dysprosium, and yttrium were isolated and analyzed for the content of the r.e.e., 1,10-phenanthroline, and HTTA. The general formula of the compounds was found to be $Me(C_{12}H_8N_2)(O_2C_3H \cdot CF_3 \cdot C_4H_3S)_3$. It was established that the ternary complexes of

UDC: 546.65:541.49

Card 1/2

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Card 2/2

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

POLUEKTOV, O.P.

Call sequence devices. Avtom., telem.i sviaz' 3 no.7:32-34 Jl '59. (MIRA 12:12)

1. Starshiy inzhener Chelyabinskoy distantsii svyazi Yuzhno-Ural'skoy dorogi.
(Telephone)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

POLUEKTOV, O.P., inzh.

Long-distance dialing set for small automatic telephone systems.
Avtom., telem. i sviaz' 2 no.9:16-20 S '58. (MIRA 11:10)

1.Starshiy inzh. Chelyabinskoy distantsii signalizatsii i svyazi Yuzhno-Ural'skoy dorogi.
(Telephone, Automatic--Apparatus and supplies)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

POLUEKTOV, R.A.

Note on IU.G.Kornilov's article "Autonomous regulations as an extreme problem." (Izvestiia AN SSSR, OTN, no.4, 1954). Izv. AN SSSR Otd.tekh. nauk no.11:152-154 N '54. (MIRA 8:4)
(Automatic control) (Kornilov, IU.G.)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

PERVOZVANSKIY, A.A. (Leningrad); POLUEKTOV, R.A. (Leningrad).

Simulation of hydraulic impacts in pressure water pipes used in hydroelectric power plants. Avtom.i telem. 17 no.4:310-323 Ap '56. (MLRA 9:8)

(Water pipes--Hydrodynamics)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

S/024/62/000/006/013/020
E140/E135

AUTHOR: Poluektov, R.A. (Leningrad)

TITLE: Invariance in systems including digital computers

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Energetika i avtomatika, no.6, 1962, 133-138

TEXT: Invariance conditions can be satisfied, or even imposed, only approximately. The article considers systems in which the parameters are measured at equal intervals of time, and the necessary calculations for approximate invariance carried out in a digital computer. An example is given involving an inertial process and servomotor without feedback. There are 2 figures.

SUBMITTED: May 3, 1962

Card 1/1

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

SHIFRIN, Moisey Shmerovich; NELEPIN, R.A., kand. tekhn. nauk, retsenzent; POLUEKTOV, R.A., kand. tekhn.nauk, retsenzent; PIVEN', V.D., doktor tekhn. nauk, nauchn. red.; VLASOVA, Z.V., red.; CHISTYAKOVA, R.K., tekhn. red.; ERASTOVA, N.V., tekhn. red.

[Automatic control of marine steam power plants; theory and design] Avtomaticheskoe regulirovanie sudovykh parosilovykh ustanovok; teoriia i proektirovanie. Leningrad, Sudpromgiz, 1963. 586 p. (MIRA 16:10)
(Boilers, Marine) (Automatic control)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

S/280/63/000/001/005/016
E140/E435

AUTHORS: Katkovnik, V.Ya., Poluektov, R.A., Chelpanov, I.B. (Leningrad)

TITLE: The synthesis of multichannel discrete (sampled data) systems in the presence of random noise

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Tekhnicheskaya kibernetika. no.1, 1963, 59-70

TEXT: The synthesis of multichannel discrete filters is undertaken in the presence of correlation between the input signals. The method ensures minimum dispersion of the sampling error. It is shown that the solution obtained is unique. The system is assumed to have infinite memory, and in this case the use of the z-transform yields the solution in closed form. There is 1 figure.

SUBMITTED: July 13, 1962

Card 1/1

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

L 9985-63 EWT(d)/BDS--AFFTC/ASD/APGC--Pg-4/Pk-4/Pl-4/Po-4/Pq-4--BC/IJP(C)

ACCESSION NR: AP3002612 S/0280/63/000/003/0073/0080

AUTHOR: Katkovnik, V. Ya.; Poluektov, R. A. (Leningrad) 74

TITLE: Synthesis of multichannel sampled-data systems for finite observation time 9

SOURCE: AN SSSR. Izv. Otd. tekh. nauk. Tekhnicheskaya kibernetika, no. 3, 1963, 73-80

TOPIC TAGS: multichannel sampled-data filters, synthesis of filters, transformation of equations

ABSTRACT: The problem of the synthesis of sampled-data systems using the minimum of the variance of a reproduction of the determined part of the input signal as the performance criterion is reduced to the solution of a system of linear algebraic equations. The solution of this system is analyzed for the case when the signal enters the system through several channels. It is noted that the solution of such a system involves considerable computational difficulties, particularly when the observation time increases. To overcome these difficulties, a method is proposed which for certain particular cases makes it possible to

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

L 9985-63
ACCESSION NR: AP3002612

transform the system of linear algebraic equations into an equivalent system of difference equations for which a closed form of solution dependent on the observation time can be determined. Such a transformation is shown to be possible for the particular but very important case when the spectral densities of random parts of useful signals can be represented in the form of a rational-fractional function. The explanation of the method is first carried out for the case when the determined part of a signal is equal to zero and the noises in distinct channels are neither mutually correlated nor correlated with a useful signal. The application of the method is extended to the general case. It is noted that the amount of calculation required for the solutions does not depend on the observation time but on the number of channels and the form of the spectral densities of the signals. The solutions obtained make it possible to study asymptotic properties of filters when the observation time is increasing. Orig. art. has: 40 formulas and 1 figure.

ASSOCIATION: none

Card 2/3

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

L 9985-63
ACCESSION NR: AP3002612

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SUBMITTED: 14Jan63 DATE ACQ: 16Jul63 ENCL: 00

SUB CODE: 00 NO REF SOV: 006 OTHER: 002

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Card 3/3

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

POLUEKTOV, R.A.

Improving the quality of transient responses in automatic control systems for several quantities. Trudy LPI no.226:179-188 '63.
(MIRA 16:9)
(Automatic control)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

S/103/63/024/004/011/014
D201/D308

AUTHORS: Katkovnik, V.Ya. and Poluektov, R.A. (Leningrad)

TITLE: Choice of program and sampling period in digital control systems

PERIODICAL: Avtomatika i telemekhanika, v. 24, no. 4, 1963, 539-547

TEXT: The authors consider the choice of controlling a program for a digital computer inserted as a correcting component into the error channel, and show that by increasing the complexity of the controlling program, it is possible to decrease the effect of disturbances applied within the closed loop, while retaining at the same time the characteristics of closed-loop system with respect to the input signal. A method of determining the optimum sampling period of the digital computer is also suggested for a multi-loop system in the case when limitations are imposed on the continuous section (in particular, limitations as to the speed of the integrating component). The optimum period is found to be the maximum

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Choice of program ...

value of the abscissa of the intersection of curves representing the absolute values of increments (per period) of the servomotor output coordinate and of the straight line represented by the product of maximum servomotor speed and of the period of sampling. There are 6 figures.

SUBMITTED: September 7, 1962

Card 2/2

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

S/0288/64/000/004/0068/0076

ACCESSION NR: AP4044825

AUTHOR: Polnektov, R.A. (Leningrad)

TITLE: Synthesis of an optimal two-channel sampled-data system with multirate extraction of data

SOURCE: AN SSSR. Izvestiya. Tekhnicheskaya kibernetika, no. 4, 1964, 68-76

TOPIC TAGS: data retrieval system, system synthesis, data extraction, system noise, two channel system, sampled data system, multirate data extraction

ABSTRACT: The paper considers the problem of synthesizing an optimal two-channel sampled-data system under the condition of minimum error dispersion for the case when the sampling period of signal measurement in one channel is greater by an integral factor than the sampling period of signal measurement in the second channel and does not coincide with the clock rate of the computer employed for realizing a system of sampled-data filters (the solution). The system, shown in Fig. 1 of the Enclosure, is analyzed under steady-state conditions. A continuous signal s(t) enters two measuring units whose dynamic properties are given by the stationary, continuous transfer functions

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ACCESSION NR: AP4044825

noise in the first channel with a dispersion equal to unity and the measurement in the second channel is made exact (without noise). Orig. art. has: 73 formulas and 1 figure.

ASSOCIATION: none

SUBMITTED: 24Oct63 ENCL: 01 SUB CODE: DP

NO REF SOV: 005 OTHER: 002

Card 3/4

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

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ACCESSION NR: AP4044825

ENCLOSURE: 01

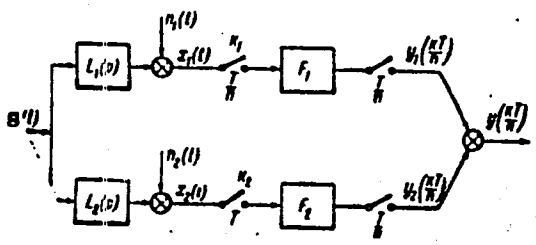

Fig. 1. Schematic representation of a two-channel sampled-data system.

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50 c

L 41182-65 EWT(d)/EWP(c)/EWP(v)/T/EWP(k)/EWP(l) Pf-4
ACCESSION NR: AP5004677 S/0115/64/000/009/0058/0059

70
18
B

AUTHOR: none

TITLE: Fourth scientific and technical conference on "Cybernetics for the improvement of measurement and inspection methods"

SOURCE: Izmeritel'naya tekhnika, no. 9, 1964, 58-59

TOPIC TAGS: cybernetics, electric measurement, electric quantity instrument, digital computer, electronic equipment, electric engineering conference

ABSTRACT: The conference was held 1-4 July at the All-Union Scientific Research Institute of Metrology by the Section of Electrical Measurements of the Council on the Problem of "Scientific Instrument Making" of the State Committee on Coordination of Scientific Research Work in the USSR together with the All-Union Scientific Research Institute of Electrical Measurement Instruments and the Leningrad Regional Administration of the Scientific and Technical Division of the Instrument Making Industry. More than 400 delegates from 29 cities of the country participated. Fifty-seven reports were heard and discussed. Reports were given by: P. V. NOVITSKIY (Leningrad)--"Definition of the Concept of Informational Error in Measurement and its Importance in Practical Use" and "On the Problem of the Average Informational Criterion of Accuracy Throughout the Entire Scale of an Instrument"; Ya. A.

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ACCESSION NR: AP5004677

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KUPERSHMIDT (Moscow)--"On Determination of the Criteria of Accuracy for Measurement Devices"; S. M. MANDEL'SHTAM (Leningrad)--report on a new criterion of accuracy of measurement instruments; P. F. PARSHIN (Leningrad)--report on optimization when using Fourier transforms on electronic digital computers; S. P. DMITRIYEV, G. Ya. DOLGINTSEVA and A. A. IGNATOV (Leningrad)--proposal of a new method for solving problems of optimum filtering for non-stationary random signals and interference; I. B. CHELPANOV--"Calculation of the Dynamic Characteristics of an Optimum Complex Two-Channel System which Uses Signals from a Position Meter and from a Speed Meter"; R. A. POLUEKTOV (Leningrad)--"Optimum Periodic Correction in the Measurement of Continuous Signals"; N. P. ADAMOVICH (Moscow)--"Analysis and Construction of Devices for Correction of Non-linearity and Scaling for Unitary Codes; G. V. GORELOVA (Taganrog)--"A Method for Statistical Optimization in Graduating the Scales of Electrical Measuring Instruments"; M. A. ZEMEL'MAN (Moscow)--"Analog-Digital Voltage Converter with Automatic Error Correction"; B. N. MALINOVSKIY, V. S. KALENCHUK and I. A. YANOVICH (Kiev)--"Automatic Monitoring of the Parameters of the Electrical Signals of Complex Radio and Electronic Equipment"; V. P. PEROV (Moscow)--"Operational Cybernetics as an Independent Scientific Specialization"; Ye. N. GIL'BO (Leningrad)--"On the Problem of Effective Non-linear Scales"; A. I. MARKELOV (Moscow)--"Devices for Preliminary Processing of the Results of Measurements Presented in the Form of

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ACCESSION NR: AP5004677

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Graphic Recordings For Subsequent Introduction of the Information into Universal Digital Computers"; O. M. MOGILEVER and S. S. SOKOLOV (Leningrad)--"On a Method for Reducing Excess Information"; T. V. NIKOLAYEVA (Leningrad)--"A Device for Temporal Discretization of Continuous Signals"; A. A. LYOVIN and M. L. BULIS (Moscow)--"Optimization of the Transmission of Telemetric Information as a Means for Raising the Efficiency and Eliminating Interference"; D. E. GUKOVSKIY (Moscow)--"On a Statistic Approach to the Detection of Events in Automatic Inspection"; M. I. LANIN (Leningrad)--"Method for Calculating the Holding Time of Communications in a Centralized Inspection System or Constant Servicing Time"; O. N. BRONSHTEYN, A. L. RAYKIN and V. V. RYKOV (Moscow)--"On a Single-Line Mass Service System with Losses"; V. M. SHLYANDIN (Penza)--report on circuit designs for direct compensation electrical digital measuring instruments; A. N. KOMOV (Novocherkassk)--report on a new method for compensation of digital bridges; M. N. GLAZOV (Leningrad)--report on the problem of voltage-to-angular rotation conversion; V. S. GUTNIKOV (Leningrad)--"Methods for Construction of Frequency Capacitance Pickups with a Linear Scale"; R. Ya. SYROPYATOVA and R. R. KHARCHENKO (Moscow)--report on the determination of the amplitude-frequency and phase characteristics of PFM and PWM modulators; Ye. I. TENYAKOV (Novocherkassk)--"The Phototransistor as a Switch for Electrical Measurement Purposes"; N. V. MALYGINA (Leningrad)--a report on ways for making universal equipment for measurement of current, voltage and power; P. P. ORNATSKIY and V. I. ZOZULYA (Kiev)--reports on the construction of static voltmeters, wattmeters and

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ACCESSION NR: AP5004677

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phase meters; A. V. TRIKHANOV, I. G. SMYSHLYAYEV, N. I. SABLIN, V. M. RAZIN and V. A. GORBUNOV (Tomsk)--report on a device for automatic processing of the measurements of vibration amplitude of pneumatic hammers; L. K. RUKINA and V. G. KNORRING (Leningrad) --report on the development of a digital compensator for measuring pressure, force, etc.; N. B. DADUKINA (Leningrad)--report on a method for constructing frequency pickups for gas analysis; Yo. M. KARPOV, V. A. BRAZHNIKOV and B. Ya. LIKHTTSINDER (Kuybyshev)--reports on analysis and recording of boring speeds; Yu. V. PSHENICHNIKOV (Kuybyshev)--"A High Speed Voltage-to-Digital Code Converter for ac Pickups"; G. P. VIKHROV and V. K. ISAYEV (Vilna)--"A Highly Accurate Digital Peak-to-Peak Voltmeter"; and S. M. PERSIN (Leningrad)--"A Low Level Analog-Digital Voltage Converter."

ASSOCIATION: none

SUBMITTED: 00	ENCL: 00	SUB CODE:	EE, EC
NO REF SOV: 000	OTHER: 000	JPRS	

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APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

POLUEKTOV, R.A. (Leningrad)

Synthesis of an optimum two-channel discrete system with multiple-period data takeoff. Izv. AN SSSR. Tekh. kib. no.4: 68-76 Jl-Ag '64. (MIRA 17:12)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

ACCESSION NR: AP4024682 S/0103/64/025/002/0201/0206

AUTHOR: Katkovnik, V. Ya. (Leningrad); Poluektov, R. A. (Leningrad)

TITLE: Optimum transmission of a continuous signal over a sampled-data link

SOURCE: Avtomatika i telemekhanika, v. 25, no. 2, 1964, 201-206

TOPIC TAGS: automatic control, continuous signal transmission, sampled data link, optimized automatic control

ABSTRACT: The problem of an optimum transmission of a continuous signal over a discrete or a discrete-continuous link is theoretically considered. The problem of synthesizing a discrete-continuous corrector, with a minimum mean-square error, was solved by L. T. Kuzin ("Designing and planning of discrete control systems," Mashgiz, 1962) by developing a discrete-continuous nonstationary filter. The present paper shows that, in the case of a minimum mean-square error at each instant of time within the clock cycle, the optimum corrector can

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KATKOVNIK, V.Ya.; POLUEKTOV, R.A.

Synthesis of discrete control systems taking into account dynamic limitations cuased by the controlled object. Trudy LPI 252:133-139 '65. (MIRA 18:9)

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L 29941-65 EPF(n)-2/EWT(d)/EWP(1) Pg-4/Pk-4/Pl-4/Po-4/Pq-4/Pu-4/Pae-2 IJP(c)

ACCESSION NR: AP5003966 WW/BC S/0103/65/026/001/0019/0027

AUTHOR: Katkovnik, V. Ya. (Leningrad); Poluektov, R. A. (Leningrad) 56 B

TITLE: Synthesizing optimal multivariable automatic-control systems

SOURCE: Avtomatika i telemekhanika, v. 26, no. 1, 1965, 19-27

TOPIC TAGS: multivariable automatic control, automatic control, automatic control design, automatic control system, automatic control theory

ABSTRACT: Synthesizing a multivariable closed-loop automatic-control system, which meets crudity conditions (i.e., retains its stability on small deviations of plant parameters and corrective-device parameters), is considered. The crudity conditions impose certain restraints upon the form of the transfer-function matrix: each element of F(p) matrix must include, as its zeros, all the zeros of the determinant of the plant matrix G(p) located in the right-hand semiplane. The final matrix equation describing the synthesis is:

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ACCESSION NR: AP5003966

$$a(-p)a(p)RH_1(p)\Phi_{xx}'(p) - a(-p)R\Phi_{xu}'(p) = Q(p). \quad (22)$$

It defines the optimal transfer functions with an allowance for stability conditions, and represents a Wiener-Hopf type of equation in the frequency region. The work of R. C. Amara (Trans. of the 1st Intern. Congr. of the Interal. Feder. on Autom. Control, 1961) and of H. C. Hsieh (IRE Trans., v. AC-4, no. 3, 1959) is connected with the above problem. Orig. art. has: 3 figures and 52 formulas.

ASSOCIATION: none

SUBMITTED: 14Nov63 ENCL: 00 SUB CODE: IE

NO REF SOV: 010 OTHER: 013

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L 13913-66 EWT(d)/EPF(n)-2/EWP(1) IJP(c) WW/BC
ACC NR: AT5028840 SOURCE CODE: UR/2563/65/000/252/0133/0139

AUTHORS: Katkovnik, B. Ya.; Poluektov, R. A. 64

ORG: Leningrad Polytechnic Institute imeni M. I. Kalinin (Leningradskiy politekhnicheskiy institut) B+1

TITLE: Synthesis of discrete control systems with consideration of the dynamic limitations imposed by the controlled element

SOURCE: Leningrad. Politekhnicheskiy institut. Trudy. no. 252. 1965. Dinamika i prochnost'mashin; mekhanika i protsessy upravleniya (Dynamics and durability of machines; mechanics and processes of control) 133-139

TOPIC TAGS: automatic control, automatic control design, automatic control theory, nonlinear control system, digital computer, random process

ABSTRACT: The problem of synthesizing the control program W(z) for a digital computer in the error path of a control loop (see Fig. 1) is discussed, and the synthesis process is modified for the case in which the controlled element imposes dynamic limitations. In Fig. 1, G(z) is the discrete transfer function of the equivalent continuous element

$$G(z)=z^{-m}G_1(z)=\frac{z^{-m}P(z)}{Q(z)},$$

proposed by Ya. Z. Tsypkin (Teoriya impul'snykh sistem. M., Fizmatgiz, 1963, s. 940) and the input x(kT) is assumed as a stationary random process (zero average value)

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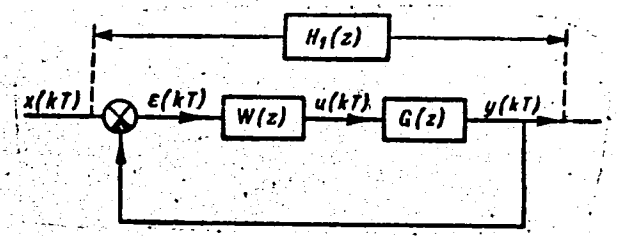

Fig. 1. Control system.

consisting of the sum of a useful signal s(kT) and errors n(kT). If the system starts at t = kT = 0, the optimum program is sought at t = NT in order to minimize dispersion of the error

$$D_\varepsilon(NT) = M[\varepsilon^2(NT)] = M[[d(NT) - y(NT)]^2],$$

where d(NT) = desired signal, y(NT) = output signal. The formulation of this problem in terms of the weighting coefficients W_j (for the digital control program) yields a system of nonlinear algebraic equations which can be transformed to an equivalent set of linear equations by the recurrent relation

$$h_k = \sum_{j=0}^{k} W_j g(kT + mT - jT) - \sum_{l=0}^{k-m} \sum_{j=0}^{l} W_j g(lT + mT - jT)\, h_{k-m-l} .$$

This process transforms the closed system of Fig. 1 to the system in Fig. 2 with the transfer function $H_1(z) = z^{-m}H(z)$. With the new variables h_k the output becomes

$$y(NT) = \sum_{k=0}^{N-m} h_k x(NT - kT - mT),$$

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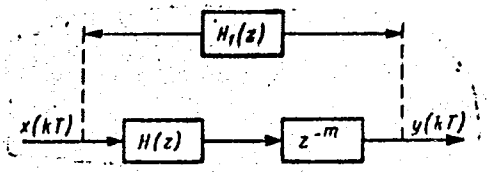

Fig. 2. Equivalent control system.

and the equations for finding h_k become

$$\sum_{k=0}^{N-m} h_k R_{xx}(kT - jT) = R_{xd}(jT + mT) \quad (j = 0, 1, 2, \ldots, N-m).$$

It is shown that the dynamic properties of the controlled element impose additional constraints, since a change in $G(z)$ leads to a change in the closed-loop transfer function

$$H_1(z) = \frac{G(z)\,W(z)}{1 + G(z)\,W(z)},$$

which results in an increase of the error dispersion over its minimum value by

$$\delta D_e(NT) = D_e(NT) - D_e(NT)_{\min} = \sum_{k=0}^{N-m}\sum_{j=0}^{N-m} \delta h_k \delta h_j R_{xx}(kT - jT).$$

The conditions that the system be nonsensitive to small changes in the dynamic characteristics of the controlled element are formulated, and the problem becomes that of minimizing

$$J_e = D_e - \sum_{\alpha=1}^{l} \lambda_\alpha J_{\tau_\alpha} + \sum_{\beta=1}^{r} \rho_\beta J_{\nu_\beta},$$

where λ_α, ρ_β = corresponding Lagrange multipliers. The equations for the

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weighting coefficients become

$$\sum_{i=0}^{N-m} h_i R_{xx}(iT-jT) - \sum_{\alpha=1}^{l} \lambda_\alpha \tau_\alpha^{-j} - \sum_{\beta=1}^{r} p_\beta \nu_\beta^{m-j} = R_{xx}(jT+mT) \quad (j=0, 1, 2, \ldots, N-m)$$

for this case and with the conditions

$$J_{\tau_\alpha} = 2\sum_{k=0}^{N-m} h_k \tau_\alpha^{-k} = 0;$$

$$J_{\nu_\beta} = 2\left[1 - \sum_{k=0}^{N-m} h_k \nu_\beta^{m-k}\right] = 0,$$

can be solved by various methods. An example is presented. Orig. art. has: 3 figures and 25 formulas.

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L 20663-66 EWT(d)/EWP(w)/EWP(k)/EWP(h)EWP(l)
ACC NR: AP6010278 SOURCE CODE: UR/0103/66/000/003/0026/0033

AUTHOR: Poluektov, R. A. (Leningrad)

35
13

ORG: none

TITLE: Limitations upon the transfer function in the synthesis of many-dimensional closed-loop systems

SOURCE: Avtomatika i telemekhanika, no. 3, 1966, 26-33

TOPIC TAGS: automatic control, closed loop system, many dimensional system, transfer function limitation

ABSTRACT: The stability of an automatic control system controlling a linear plant with n input and n output coordinates is considered under the assumption that only the difference between the input signal r(t) and the output signal y(t) can be measured, thus the correcting device can be switched only into the channel of errors.

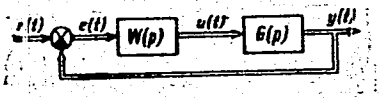

Fig. 1

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L 20663-66
ACC NR: AP6010278

Assuming that the transfer matrices G(p), W(p), and H(P) describing the dynamic characteristics of the control plant, the correcting devices, and the closed-loop control system, respectively, are rational functions of the Laplace operator p, the problem of establishing the conditions which the transfer matrix H(p) must satisfy in order to ensure the global stability of the control system is analyzed. Using the concepts of controllability and observability of control systems introduced by R. E. Kalman, the conditions are established under which: a) the noncontrollable or nonobservable part appears in the open-loop control system consisting of successively switched on completely controllable and observable many-dimensional units; b) the closed-loop system is stable when the open-loop system is incompletely controllable or observable. To establish these conditions, the relationships between the concepts of controllability and observability and the conditions for compensating the zeros and poles of the transfer function of the control plant were analyzed. Conditions on the transfer matrix H(p) ensuring the stability of a control system with the given matrix G(p) presented in Fig. 1 are derived in the form of two equations. Orig. art. has: 37 formulas and 3 figures. [LK]

SUB CODE: 12 SUBM DATE: 19Apr65/ ORIG REF: 002/ OTH REF: 004
ATD PRESS: 4223

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

L 43670-66 EWT(d)/EWP(v)/EWP(k)/EWP(h)/EWP(1) BC

ACC NR: AP6023659 SOURCE CODE: UR/0103/66/000/004/0024/0031

AUTHOR: Poluektov, R. A. (Leningrad)

43
B

ORG: none

TITLE: The problem of the synthesis of multidimensional closed-loop systems with random input signals

SOURCE: Avtomatika i telemekhanika, no. 4, 1966, 24-31

TOPIC TAGS: dynamic system, linear control systems, servosystem, optimal automatic control, random noise signal

ABSTRACT: The paper deals with the formulation and solution of the synthesis problem in the case of a system used in the control of a multidimensional plant. The system is assumed to be linear and optimal, operating in the presence of random input signals, with the correcting device built into the error channel. Mathematical expressions are derived for the determination of the optimal dynamic characteristics of the system, and a method, based on a Lagrange factor matrix approach, is proposed for their solution. An example is given, illustrating the synthesis of a system with two controllable coordinates. In the solution of the problem, allowance is made for the limitations caused by the prescribed portion of the system. Orig. art.

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

S/118/61/000/002/002/007
A161/A126

AUTHOR: Poluektov, S.I., Engineer

TITLE: Automation of long-time operations in production of electrovacuum and semiconductor instruments

PERIODICAL: Mekhanizatsiya i avtomatizatsiya proizvodstva, no. 2, 1961, 9-17

TEXT: Detailed engineering information including the calculations is given on two new "dual-rotor" ("birotornyye") machine designs developed by the Leningradskoye konstruktorskoye byuro (Leningrad Design Bureau). The one is a semi-automatic for activating processing of electrovacuum devices (the process is described and illustrated by a schematic diagram of a penthode being processed), the other for electrolytic pickling of semiconductor junctions. The detailed description of both is given. The general design principle is one center rotor performing intermittent rotary and axial motion, and a number of rotors on the periphery of the center rotor. The processing time is between 1 and 150 min, and it is important to treat simultaneously as many devices as possible. The processing machine accomodates 966 tubes placed in seven rows on the rotors. The feed system is placed inside the base casing. Both machines are driven by an

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POLUEKTOV, S.I., inzh.

Birotary system for machines for parallel step-by-step operation. (MIRA 14:5)
Vest.mash. 41 no.8:52-59 Ag '61.
(Machine tools)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

POLUEKTOV, S.I., inzh.

Automation of time-consuming technological processes in the manufacture of electric vacuum and semiconductor instruments. Mekh.i avtom. proizv. 15 no.2:9-17 F '61. (MIRA 14:2)
(Instrument manufacture) (Automation)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

POLUEKTOV, V. (g. Rostov-na-Donu)

Urgent needs of Rostov riflemen. Voen. znan. 38 no.11:27-28 N '62. (MIRA 15:11)

(Rostov-on-don--Rifle ranges)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341910017-4

POLUEKTOV, V.

Efficient technique. Den. i kred. 20 no.1:68-69 Ja '62.
(MIRA 15:1)

1. Starshiy inspektor glavnoy bukhgalterii Moskovskoy oblastnoy kontory Gosbanka.
(Moscow Province--Banks and banking--Accounting)

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POLUEKTOV, V.A. (Moscow); PSHEZHETSKIY, S.Ya. (Moscow); CHEREDNICHENKO, V.M. (Moscow)

Critical conditions for the inflammation of butane with oxygen and the effect of surface. Zhur. fiz. khim. 35 no.2:389-392 F '61. (MIRA 16:7)

1. Fiziko-khimicheskiy institut imeni Karpova.
(Butane) (Combustion)

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